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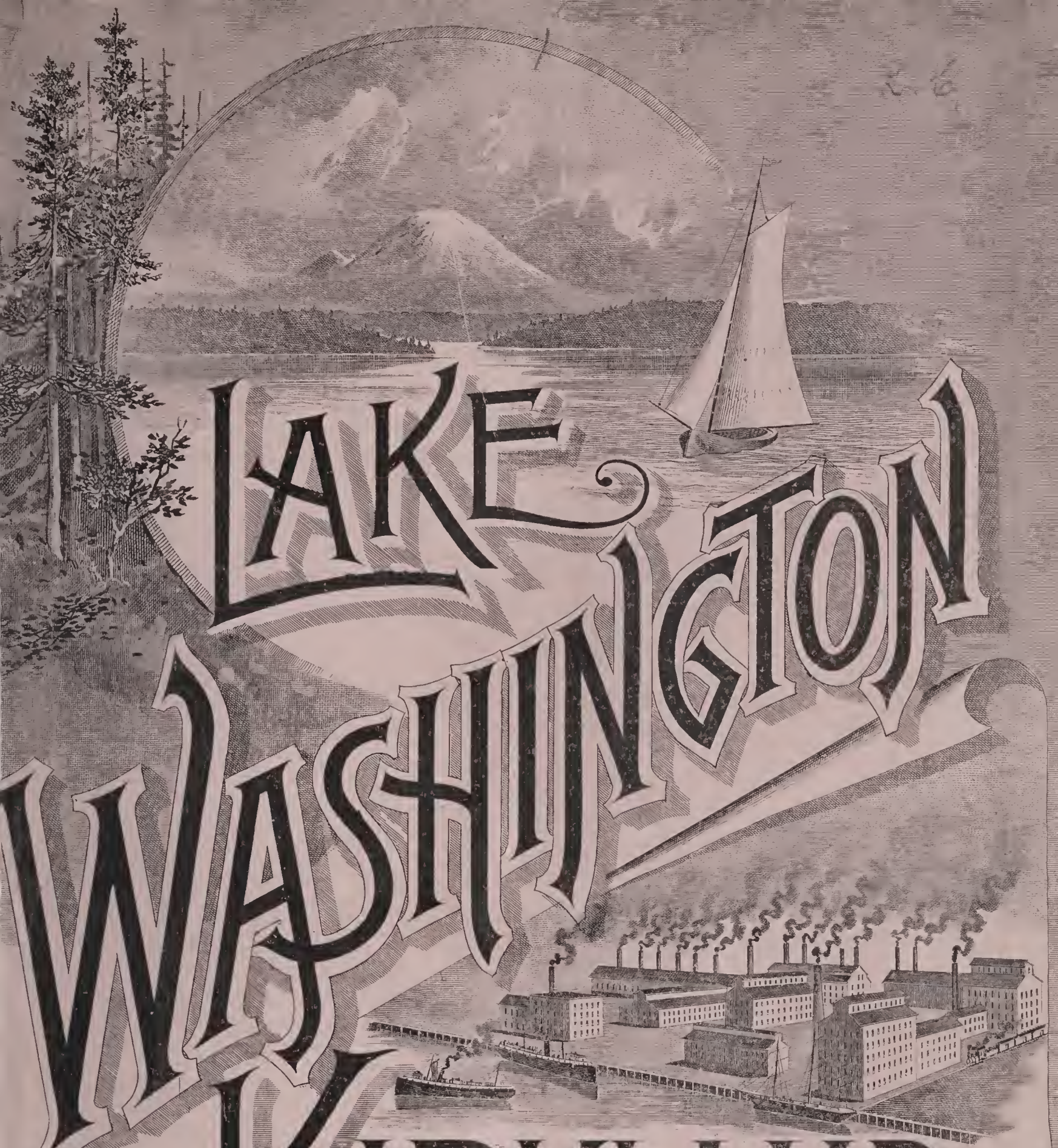

COMMERCIAL KEY OF THE PUGET SOUND REGION.

LOWMAN & HANFORD LITHO CO. SEATTLE

MAP
OF
WESTERN WASHINGTON,
SHOWING THE
Lake Washington Belt Line Railroad
AND CONNECTIONS,
AND THE
COAL, IRON AND MINERAL DISTRICTS
OF THE PUGET SOUND REGION.
Copyrighted 1891, by Alex. G. Anderson, for
THE LAKE WASHINGTON BELT LINE COMPANY.
RICHARD NEVINS, JR., C. E.
SEATTLE, WASH.
VANCOUVER ISLAND
STRAIT OF JUAN DE FUCA
PACIFIC OCEAN
GRAYS HARBOR
CAPE FLATTERY
PORT ANGELES
NEW DUNGENESS
VICTORIA
ADMIRAL ISLAND
SAN JUAN ISLAND
ORCAS ISLAND
LOPEZ ISLAND
WHIDBEY ISLAND
UTSALADDY
CAMANO ISL.
ADMIRALTY INLET
PORT TOWNSEND
ANACORTES
SEHOME
FAIRHAVEN
WHATCOM
SUMASS.
MT. VERNON
SEDRO
HAMILTON
IRON
COAL FIELDS
SAUK CITY
FAIRHAVEN & SOUTH'N R.R.
CASCADE MINING DISTRICT
COLD DIGGINGS
PASS 5,050
MT. BAKER 10,500
MT. SHUKSAN
GLACIER PEAK
INDIAN PASS
LEAD AND SILVER
MINERAL CITY
CAPT'S PASS
SNOHOMISH
SULTAN CITY
INDIA MT.
MT. HOWARD
WOODINVILLE
KIRKLAND
HOUGHTON
TOLT
SEATTLE
W. SEATTLE
COAL CREEK
NEWCASTLE
RENTON
TALBOT
KENT
GILMAN
PRESTON
FALLS CITY
SNOQUALMIE
NORTH BEND
COPPER
IRON
CUYE IRON MINE
COLD SILVER AND COPPER
DENNEY IRON MINE
SNOQUALMIE PASS 3,010
STAMPEDE PASS 3,693
DURHAM
BRUCE
PALMER
BLACK DIAMOND COAL
FRANKLIN COAL
BUCKLEY
WILKINSON
CARBONADO
DOUTY
NATCHES PASS 4,925
MT. RAINIER 14,444
TACOMA
OLYMPIA
ROY
TENINO
CENTRALIA
COAL FIELDS
CHEHALIS
PORT TOWNSEND
P. S. & G. H. R. R.
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BLUE CANYON COAL MINES
COAL MINES
LAKE WILSON
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GRAYS HARBOR
HOQUIAM
ABERDEEN
CRAY'S HARBOR CITY
Chehalis
Deschutes
Nisqually
Cowlitz
Cispus
Stillaguamish
Snohomish
Skagit
Nooksack
Puyallay
Green
White
Carbon
Cedar
Tolt
Snoqualmie
Wallace
Sammamish
Duwamish
Puyallup
Hoodsport
Shoal Water Bay

LAKE WASHINGTON

RESOURCES OF THE REGION TRIBUTARY TO ITS EASTERN SHORES AND THE BELT LINE RAILROAD

KIRKLAND

THE MANUFACTURING CITY OF THE PUGET SOUND REGION

WITH MAP AND ILLUSTRATIONS

KIRKLAND, WASHINGTON

17142 W

LOWMAN AND HANFORD STATIONERY AND PRINTING COMPANY
1891

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PUBLISHER'S PREFACE.

The publishers of this pamphlet have endeavored to give in its pages such general information regarding the resources and advantages of the region tributary to Lake Washington, as shall be of practical value to parties wishing to locate in Washington, either for the purpose of establishing manufacturies of any kind, or settling on farms, garden tracts, or seeking employment in a new town whose future is assured. They have but one object in view in publishing and distributing this work and that object is to induce immigration to this point and to direct the attention of those who have already decided to settle in Washington, to the advantages of the eastern shores of Lake Washington, especially for manufacturing.

The facts given in these pages cover a variety of subjects and the information conveyed is in no case contorted or exaggerated; on the contrary, conservative statements are made in every case where facts are given, which, to those unacquainted with the region, would seem preposterous.

Different subjects treated herein are not, of course, given in that detail which might be wished or required by parties having in view the establishment of any particular manufacturing enterprise—an encyclopedia of a dozen large volumes would scarcely do that—but the publishers think the information given will prove interesting reading to manufacturers, business men and artisans of all trades, and come as a revelation to the majority. Those wishing further information on any particular subject have but to correspond with any of the corporations or individuals interested in the properties and manufactories at or in the vicinity of Kirkland, and all possible information will be promptly furnished them.

This pamphlet is published not by one corporation or company, but by all those corporations and individuals interested in the manufactories now being and soon to be established on the east shores of the lake, their idea being that the more manufactories established at this point the better it will be for all, as competition is out of the question, owing to low cost of manufacturing almost anything from a pin to a ship, and the market so wide; while the benefits from the close association of manufactured material will be felt by all. They feel also that at no other point in Western Washington or in the Union can manufactories of almost any character be established and run to such profit as on the eastern shores of Lake Washington, on the Belt Line Railway.

KIRKLAND, *May 1, 1891.*

WASHINGTON.

THE American who has taken the journey "from the rising to the setting sun," across the broad domain of Uncle Sam, has seen wonders of nature that for vastness, grandeur, richness and beauty, could not be surpassed in any other country on the globe. He has traversed fertile plains and more fertile valleys; burrowed through or climbed in winding lines grand snow-capped mountain ranges; he has crossed or followed in circuitous routes pretty streams, roaring mountain torrents and great and mighty rivers; skirted the shores of beautiful lakes, on the plains and in the mountains, and viewed the waters of mighty inland seas; he has traveled thousands of miles through a country of cultivated fields of grain and produce and orchards of every variety of fruit, and again over miles upon miles of virgin prairie or through leagues of forest primeval. He has passed through rich mineral regions, where lavish nature has deposited within easy reach, vast stores of all the useful and precious metal ores known to civilization. If he be a man of broad views with an active mind, ever so well read, or highly educated, his soul has been expanded by this ocular demonstration of that which he, perhaps, already knew—the incalculable natural wealth and sublime grandeur of the country which is the inheritance of the noblest nation yet moulded by destiny.

George Washington and his compatriots realized but in a small measure the wealth of the country they won for the nation born to the union

of freedom and the sword, but it is most fitting that the section of that country, within whose borders are found in lavish profusion, almost all the natural resources of the entire domain, should bear the name of the patriot worrior and statesman who led the glorious struggle for the freedom of America, and so become—the State of Washington.

After passing the great Rocky Mountain range, the traveler from the East has entered the borders of the state which is the prototype of the entire country. He will travel on to the Pacific through every phase of nature—above, about and below—which he has seen or heard of during all his long journey from the far away Atlantic seaboard, the only difference being that here all nature seems intensified or magnified—the scenery more grand ; the plains and valleys more fertile ; the forests more magnificent in their boundless extent and wealth of giant trees ; farms and orchards and grain fields more fruitful ; mineral formations more diversified, abundant and rich ; natural waterways more convenient for commerce ; climate more equitable—and the seeming is indeed real. One might imagine that the Creator had formed the rest of the United States and then condensed the whole grand work into the region now known as the State of Washington.

The State is traversed north and south by the Cascade range of mountains, dividing it into two sections, considerably dissimilar in climate and topography—both of unlimited wealth in natural resources. The climate of Eastern Washington is subject to greater extremes of temperature than the western half of the State, although much milder than the same latitudes east. The widening of the Cascade range in the northern part of the state, extending eastward, north of the Columbia river, forms the mountain region known as the Okanogan country, rich in all the minerals of commerce. South and east of the river, the great Columbia plain is a rich plateau, covered with bunch grass, affording extensive cattle ranges, and, where cultivated, growing wonderful crops of cereals, averaging higher than the crops of any other state in the Union. At the state exposition held at Spokane Falls in 1890 was exhibited a pyramid of 101½ bushels of wheat grown on one acre of land in Whitman county. This yield has been surpassed in some sections of Western Washington.

That portion of Washington west of the Cascades is the region of Puget Sound ; that fertle basin of the Northwest so prolific in products and rich in minerals, that the relation of facts in regard to it sounds like romance, worse than ordinary exaggeration, to those who have not actually traveled through it and made investigation. Reference to the forests of fine timber, to the mines of iron, coal, stone, the precious metals and other minerals will be made later on, as also to the fertility of the valleys, flats and upland country. Nature has done her utmost for Western Washington, and not satisfied with the wealth bestowed, has provided for the convenience of commerce, the most wonderful natural

waterway and harbor, not alone of the Pacific coast, but of the world—Puget Sound.

Puget Sound is a great succession of bays and channels, extending southward from the straits of San de Fuca, with interminable windings, between the Cascades and the Olympics, for nearly 100 miles, but so numerous are its large islands, and so extensive its ramifications that it has a shore line of more than 1,800 miles, and, rarely disturbed by storms, with a depth of from 300 to 600 feet, without bars, shoals or rocks, and navigable for the largest vessels close to shore in most localities, its value as a commercial highway is as great as nature could make it.

No wonder then, that so soon as the natural wealth, resources and advantages of this region had become widely known and to some degree appreciated, both labor and capital should be brought to bear for its development in such haste, that within a few years great cities should grow into being, miles upon miles of railway be built and enterprises requiring millions of money be set on foot. The recounting of such a surprising commercial movement is the history of Washington for the past five years. The population of the state in 1885 was 127,292; the federal census for 1890 places it at 349,516, a larger percentage of gain than any other state in the Union. In a list of the 47 states and territories according to population in 1880, Washington stood No. 42. In that of the 49 in 1890, Washington stands 34, having gained more places than any other, all of which gives an idea of the constantly increasing immigration into the state. Nearly two-thirds of the population of the state is in Western Washington.

It is but a few years since that great agent for development, the railway, had yet to penetrate the forests or plains of Washington, yet at the close of 1890, there were in operation 43 line and branches, with a total mileage of 2,080.93, with many other lines under construction and more projected and surveyed. Most of these lines are in Western Washington. In 1890 there was constructed 372.15 miles of road at a cost of $7,040,940. This is by far more than built in any other western state excepting Montana, and but 63.46 miles less than in that state, through which was built that year, so many miles of the Great Northern, on its way to Washington. There are under construction now, on 20 roads in Washington, 951.41 miles, 603.41 more than in Montana and 426.41 more than is being constructed in any other western state. There have been projected and surveyed in the State 1,472 miles, most of which undoubtedly will be constructed. These railroad plans for the future, far exceed those for any other state, and are the most convincing evidence of the interest now being taken by large capitalists, in the development of Washington.

Industrial development is both the cause for and the effect of railway building, and its bearing in either direction may be estimated when fig-

ures giving an idea of its magnitude are obtained. As an indication of the increase of active capital brought to bear on the development of Washington during 1890, the following extract from the report of the secretary of state, Allen Weir, is to the point:

"The number and character of incorporations is an excellent indication of the manner new capital is employed for investment and for the development of the resources of the state. The record for the year is greater than that of any previous year. The total is 776 against 668 for 1889. The total capitalization is $188,028,950, of which doubtless a very large fraction is already actively employed."

It is safe to say that more than three-fourths of this new capital has been invested west of the Cascades.

The rapid settlement of Washington and the phenomenal growth of her cities, especially those on Puget Sound, are well known facts. Easily leading all cities in point of population, wealth and activity, is Seattle, between Elliot Bay on the Sound and Lake Washington, having miles of frontage on both bodies of water.

The increase of commerce at Seattle during 1890 was very large, her jobbing business being $31,000,000, an increase of $11,000,000 over the previous year. Her manufactories produced an output of goods valued at $11,000,000. But manufacturing in the State of Washington is in its infancy. As yet the extensive iron mines have scarcely been opened; although vast quantities of coal have been mined, the wealth of the State in that important manufacturing factor has hardly been touched; although the manufacture of lumber, lath and shingles has been enormous, the making and building of the numberless articles for which lumber is used has been left to other states, and so on through the whole list of natural products of the country. This, however, is beginning to change, as is most natural, and there are springing up new enterprises, fostered by men who appreciate the great profit in manufacturing where material of every conceivable description is close at hand, and shipping facilities already good and being augmented as fast as capital and labor can accomplish the work. In a few years Seattle will be a greater railway center than any other point on the Pacific coast, with four, if not five transcontinental railways running to her docks, and a network of roads reaching out, north, south and east, to all parts of the state. In this vicinity therefore will be best brought together the raw materials and products of the state, and in this vicinity will be established the most and more extensive manufactories.

The City of Seattle is almost surrounded by water. To the west is Elliott Bay, to the north Lake Union, and to the east that magnificent body of fresh water, which is destined to become as important a factor in the commerce of Washington, as is the harbor of New York in that of the Empire State—Lake Washington.

LAKE WASHINGTON.

"A BEAUTIFUL sheet of water; picturesque and grand!" is the exclamation of the traveler as he first gets a view of the waters and surroundings of Lake Washington, but the man of thought and enterprise, as he learns its characteristics and geographical position, catches a glimpse of coming commercial wealth and activity through the magnificent views of nature upon which he gazes.

From the crest of the ridge which divides Lake Washington from Puget Sound, the view either to the west or east is sublime. Toward the setting sun lie the placid waters of the sound, beyond which rise the timbered slopes of Kitsap county, and still beyond the snow-capped peaks of the Olympic loom up to form a jagged horizon. Toward the east, just below, glisten the waters of the lake, reflecting in dark shadows the forests of the opposite shores. Here and there the woods, which come right down to the water, are broken by clearings, cultivated fields and towns along the eastern shore. Back from the shore the evergreen forests roll upward toward the Cascades, and the horizon is cheated of its even line by the grotesque outline of the mountain peaks, which stretch from north to south, terminating in that snow-crowned glory, Mt. Rainier, which, though 60 miles away, appears to rise from the water's edge at the foot of the lake. The great height of the mountain, 14,444 feet, and the clearness of the atmosphere, give this impression of nearness.

Lake Washington is 18 miles from north to south, but its windings make the actual length several miles longer. It is generally from two to three miles wide, though at Union Bay and Mercer Island it is over four miles from shore to shore. It covers an area of 41 square miles, and has a shore line of about 70 miles. The only island, of any consequence, in the lake, is Mercer Island, toward the southern end, which is about five miles long by two wide. The depth of the lake is very great, and like Puget Sound the shores are abrupt enough to admit the largest ocean vessels to come close in.

A few years ago the dense fringe of forest encircled the lake with scarcely a break perceptible. The bear, the deer and their companions of the wood, came unmolested to drink on the beach, and the myriads of wild fowl were free from the possibility of fright at the puffing steamer. There were, perhaps, here and there, a logger's camp or a pioneer's cabin, but on the whole it was a magnificent wilderness, and the signs of a great development were indeed few. To-day the scene is changed ; the logging camps are more numerous and large lumber mills at different points are doing their share of the great lumber business of the Puget Sound region. Fruitful farms have been cleared about the pioneers' houses, and substantial residences taken the place of the log cabins. Towns have come into existence and are rapidly growing, and to accommodate traffic a score of steamers ply between the different points. And now, too, along the eastern shore is being rapidly pushed to completion, a railway, which will be the direct traffic line of the Northern Pacific railroad, known as the Lake Washington Belt Line. It will not be long till a ship canal from the sound to the lake will afford the way for ocean vessels to reach and meet the tracks of the railway on the shores of what will then be the finest fresh water harbor in the world. Extended mention of both these enterprises will be made later on.

Lake Washington is the largest body of fresh water in the western part of the State, and at Seattle is but three miles from the sound. It is fed by numerous small streams, and into it, at the northern end, empties Sammamish slough, which is the outlet of Sammamish lake. This lake lies east of Lake Washington from five to six miles ; is seven miles north and south and about a mile and a half wide ; its waters are deep and shores abrupt ; its southern end is within a few miles of the Gilman coal mines, and to the east of it is the fertile Snoqualmie valley.

The natural outlet of Lake Washington is the Black river, which flows south-west from its southern extremity, and at Black River Junction, unites with the Duwamish, which in turn empties into Elliott bay. There is, however, another route by which some of the water finds its way into the sound. Reference has been made to the chain of waters which bounds Seattle on the north. It is formed by Union bay, extending east from the main body of Lake Washington, a short canal

to Lake Union, which finds an outlet to the sound by a small stream which empties into Salmon bay, an inlet of Shilshole bay. It is by the widening, deepening and straightening of these waters, where necessary, that it is proposed to make a water way from the sound to the lake ample enough to accommodate the sea-going vessels that now visit the waters of Puget Sound. This will mean an unrivalled harbor in the waters of Lake Washington for the vessels which must carry the exports of the manufactories which are already being established on the eastern shore for the purpose of utilizing the raw material, products and natural wealth of the state, all so readily accessible from this point.

It was, primarily, because of the unequaled advantages of the eastern shore of Lake Washington as a manufacturing site, that the railway now building through that section was projected, and when, in 1890, the Northern Pacific had practically secured control of the Seattle Lake Shore & Eastern, the construction of the Lake Washington Belt Line was immediately begun.

LAKE WASHINGTON BELT LINE.

LAKE WASHINGTON, being in King county, near to the sound, is very nearly in the geographical center of the western section of the state, and the topography of the Puget Sound region has aided in making its immediate neighborhood the commercial and transportation center also. Toward this point converge all the railways from the east, south and north, and Seattle, lying between the lake and the sound, is the chief port of the state. It is not surprising, therefore, that King county is the wealthiest county of the state and that its assessed property valuation should jump from $23,503,890 in 1889 to $44,045,275 in 1890, having nearly doubled in one year. It is, too, the wealthiest county in natural resources.

The Northern Pacific Railway, which was the first trans-continental road to reach a turminus on Puget Sound, did not long remain satisfied with this achievement. It had reached, to be sure, a point on the Pacific coast where it could handle its share of the great export and import traffic with the nations of the East, but it had, too, done something more ; it had tapped the richest region of the coast, whose resources when developed, would demand extensive traffic facilities. The great company was not slow to recognize this fact, and it has lost no time in building lines and gaining control of others reaching out in every direction through the state. Its plans for the future are even more ambitious than its past accomplishments. In the summer of 1890 the Northern Pacific secured control of the Seattle, Lake Shore & Eastern, whose line was then being completed north from Seat-

tle through the heavy timber and rich valleys of Snohomish, Skagit and Whatcom counties to the international boundary, and so to a connection with the Canadian Pacific, which runs a spur to the boundary from Mission on the Frazer river. The acquisition of this road was followed by an agreement made with the Oregon Improvement Company for traffic arrangements over the Seattle & Northern, which is now built east from Anacortes through the rich agricultural, mineral and timber region of the Skagit valley as far as Hamilton and is being rapidly pushed to Sauk City, at the foot of the Cascades. All the territory to the north was thus taken care of; that to the east and south had already been secured; it remained to make the best possible connection at the central point, and occupy the territory where most conveniently could be brought together for manufacture and reshipment the varied resources and products of the state. It was with this end in view that the construction of the Lake Washington Belt Line was begun.

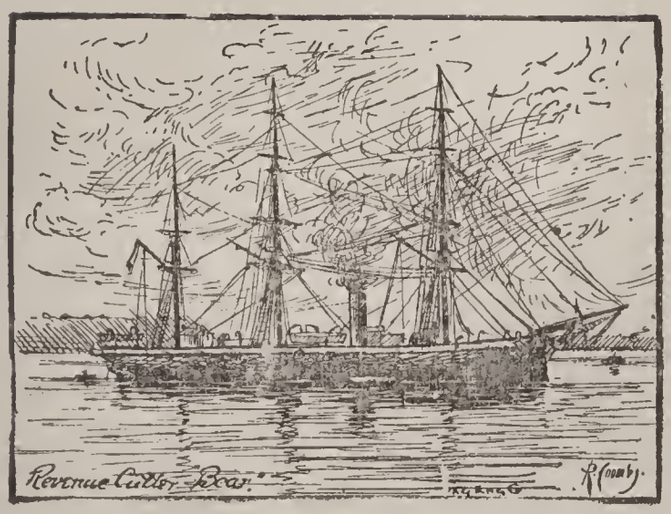
It may perhaps be interesting to know who are the men backing the enterprise, and who subscribed the $2,000,000 capital of the Belt Line Company. They are all railroad men and capitalists of national reputation. The list includes, J. D. Rockefeller, Gen. John H. Bryant, Colegate Hoyt, James McNaught, J. F. McNaught and L. S. J. Hunt.

The construction of the road was begun in August, 1890, and is now completed. It is 23 miles long. Leaving the Northern Pacific at Black River Junction, about two and a half miles southwest of the lake, it passes through Renton, crosses the Cedar river and the tracks of the Columbia & Puget Sound Railroad, and striking the foot of the lake runs along the eastern shore, keeping close to the water for six miles, when it crosses Mercer slough, and so on up through Houghton, Kirkland and other towns along the lake to a connection with the Seattle, Lake Shore & Eastern near Woodinville Junction two and a half miles above the head of the lake. Nowhere on the road is there a grade of more than one per cent. This makes a much shorter route for the Northern Pacific for traffic north and south than by the circuitous route around by the sound through Seattle, and around again by the north to the east of Lake Washington. This fact has given rise to the generally accepted belief that the building of the Belt Line was merely for the accommodation of the through freight traffic, from and to the north, of the Northern Pacific. Although this advantage is gained, there was a much stronger incentive for the building of the Belt Line. Its projectors realized that the eastern shores of Lake Washington would offer the most advantageous manufacturing sites for enterprises sure to follow the opening up and development of the country. The lake, easily connected with the sound by a ship canal, would also offer many more advantages as a harbor than salt water, and would bring vessels close in to the very gates of the region of timber, coal, iron and other minerals between the lakes and to the east.

Between the two lakes, not far from the southern end of Lake Washington, are situated the Newcastle coal mines, and to the south-east, on the Columbia & Puget Sound road are the Black Dimond, Franklin and Cedar Mountain coal workings. The eastern line of the Seattle, Lake Shore & Eastern railway leaves Woodinville Junction and runs south along the eastern shores of Sammamish lake, through a heavily timbered country, past the Niblock coal mines and those at Gilman, and then turns east up the Snoqualmie valley, through prolific hop lands and forests of giant firs and cedars, to the Snoqualmie mineral region, where the Denny iron mines are. At present the road is completed as far as Sallal Prairie, and during the summer of '91 will be extended 25 miles further east to Snoqualmie Pass, if indeed it is not carried through to a junction with the Northern Pacific, east of the mountains, which would give that road two routes through the Cascades.

To this point on the east of Lake Washington, will therefore pour in the wealth of agriculture, timber, coal and minerals from all directions; from the north the output of the Snohomish, Skykomish, Stillaquamish, Skagit and Nooksack valleys and the mineral regions back of them; from the east the timber, agricultural and mineral products of the Snoqualmie valley and the Cascades; from the south the coal from the King county mines, and the yield of the hop fields and agricultural lands of the White river, Puyallup, Chehalis and Cowlitz valleys, and all the rich country contiguous to them. The builders of the Belt Line saw that here must be brought together the material for manufactories; that here was the most advantageous point for the establishment of large productive enterprises. The hilly character of the land between the lake and the sound, making it impossible to enter or leave Seattle by rail, except on the water front, and the spreading of the city over so large an area, precluded the feasibility of establishing large works west of the lake—they must by every natural cause be located on the east shore. The only possible drawback, if such indeed it could be considered while railway facilities could be so readily obtained, was its distance from salt water and ocean shipping, but even this will be, in the near future, one of its greatest advantages, for by the building of the canal from the sound the shipping will be admitted but the salt water still be excluded.

THE SHIP CANAL.



THE feasibility of constructing a canal to connect Lake Washington with the sound has long been acknowledged, as has the great commercial advantages which would thereby accrue. Along the shores of the chain of waters which needed but short connecting links to make a clear waterway from lake to sound, have been established numerous saw mills, and about these mills have collected little hamlets that are now suburbs of Seattle. To bring to the mills on Lake Union, by water, timber cut on the shores of Lake Washington, the idea of cutting a small canal from Union bay to Lake Union was conceived. In 1884, D. T. Tenny, E. M. Smithers and associates formed a company and executed the work. This small canal is still used as a waterway for logs, and is a source of large revenue to its owners. This small beginning in the way of complete connection, drew the attention of those interested more closely to the project of a ship canal, and the making of Lake Washington a vast land-locked fresh water harbor for seagoing vessels. It was endorsed by all who gave the subject any consideration, and as a result of the growing feeling favoring its accomplishment the matter was brought to the attention of Congress by Senator Squire and Congressman Wilson. That body, in its river and harbor bill of 1890, incorporated a clause authorizing a preliminary survey and appropriating $10,000 for the purpose. Acting under the provisions of this bill, the chief of army engineers appointed a commission consisting of Col. D. H. Mendell, Maj. T. H. Handbury and Capt. Thos. W. Symons to supervise the survey, and they appointed Engineer P. G. Eastwick to prosecute the work.

The survey was begun by Engineer Eastwick and a corps of 20 engineers in the latter part of October, '90, and the field work was completed the last of February, '91, when Engineer Eastwick closed his office at Fremont and returned to his headquarters at Portland to make out plans and estimates to incorporate in his report.

The writer had a long conversation with Mr. Eastwick at the close of his field work, during which the veteran engineer gave many facts and figures gained by his work on the survey, and all his statements prove most conclusively that the canal can be constructed at a very moderate cost considering the many great advantages for the commercial interests of the territory that would thus be made accessible to vessels of all nations. The work done in the field comprised extensive topographical and hydrographic surveys, extending from the sound, through Salmon bay, Lake Union, Lake Washington, and of the shores of those bodies of water, and of the valley between the head of Lake Washington and Sammamish lake, and of the shores of the latter body of water, for the survey also includes a project to connect by canal those two lakes. The following figures of altitudes and distances, will give some idea of the work which will be required: The height of Lake Union above high water of the sound is 12 feet, Lake Washington, 18 feet, Sammamish, 28 feet. The distance from deep water in the sound to the head of Salmon bay is one and three-quarters miles; from the bay to Lake Union, one and one-quarter miles; two miles through Lake Union, and three-eights of a mile to Union bay and Lake Washington. The survey made from Lake Washington to Sammamish lake cuts off many widenings of the slough and is 12 miles long.

Mr. Eastwick states that he should submit in his report several different estimates and plans for construction, varying both in engineering method and in material construction, and having a very large difference in cost. He asserted that there was not the shadow of an engineering difficulty in the way of the project, but on the contrary conditions were very favorable for the work. The formation of the ground through the portages between the lakes and between Lake Union and Salmon bay is such that excavation will be easy, more especially as the route will be by the small waterways between those points. About a mile of dredging will be necessary in the upper end of Lake Union, which has a soft, muddy bottom, and some dredging will have to be done at the head of Salmon bay and at the head of Union bay, all of which will be light work, and will cost less than the average cost of grading for a railway the same distance. The maximum cut through the portage will be but 40 feet. The low cost plan which will be submitted contemplates admitting vessels only at high tide. By this plan the level of Lake Washington would be lowered to that of Lake Union, and locks at the head of Salmon bay would raise vessels 12 feet to the level of the lakes and into fresh water. A channel would be dredged from Shilshole bay to the locks, to admit all vessels at high tide, and at some future time locks could be constructed at the entrance to the bay, which would keep its waters at high-tide level, and by the dredging of the channel into Shilshole bay and the construction of jetties to protect it, vessels could enter at all stages of the tide. Different specifications which will be submitted will provide for either stone or

heavy timber construction in fresh water. Plans will also be submitted for an entrance by way of Smith's Cove which extends from the sound south of Salmon bay up toward the head of that inlet.

Although the survey of the Sammamish canal has been made it is not certain that it will be constructed at present though the work would be light and the benefit alone derived by the reclaiming of some 10,000 acres of bottom lands along the slough would more than justify the undertaking, to say nothing of the benefit to commerce by admitting shipping to Sammamish lake.

But the canal to Lake Washington is assured. Should Congress fail to follow up the work, the interests involved are so vast and important that private capital will not hesitate to take up the undertaking. Perhaps the benefit of a fresh water harbor for sea-going vessels is not thoroughly understood. All vessels in salt water gather great masses of barnacles, 20 or 30 tons of such matter sometimes accumulating on the bottom and sides of a 1,000-ton ship. To remove this matter the vessel must go on the dry dock and a gang of men with chisels and crowbars be employed in the cleaning. This entails great expense through labor and loss of time. A short stay in fresh water will clear barnacles from a ship with little or no expense, so that the saving in this direction would be large. But the saving in another way would be even greater. The cost of maintaining wharves and warehouses along the front of a fresh-water harbor is insignificant in comparison with that of keeping in repair the same structures in salt water, where the ravages of the teredo soon honeycombs and weakens the piling. During 1890 a half dozen large wharves on Seattle harbor broke down under their load, entailing a loss of thousands of dollars. The life of a pile in salt water is less than two years, so that all the vast structure of wharves and trestle work of the harbor is actually replaced by repairing during that time. It costs the Seattle, Lake Shore & Eastern over $3,000 per month to keep their tracks along the water front in Seattle in repair. There would be little of this enormous expense in fresh water. Ships while in this fresh water harbor would be absolutely free from disturbance by tide or storm. The actual saving in these directions would in a very short time be much greater than the cost of the ship canal. But above all there are the advantages which will be gained by bringing shipping within easy reach of the region of timber, coal, iron, limestone, granite, marble, potter's clay, fire clay, plumbago, and so many natural resources, and to a point where best these products can be brought together for manufacture—the eastern shore of Lake Washington.

Already this location has been taken advantage of, and there is now being built at Kirkland works for the greatest manufacturing enterprise not alone of Washington, but of the entire Northwest—the extensive works of the Great Western Iron & Steel Company.

THE KIRKLAND STEEL WORKS.

Reference has already been made to the remarkable proximity in King County of timber, coal, iron ore, limestone and fire clay, a grouping of materials necessary for the smelting of iron ore and manufacture of steel, equaled in no other State or country. These materials, too, are all of superior quality to those found elsewhere, as will appear later on in special reference to each of them.

In 1886 Mr. Peter Kirk, one of the owners and managers of the great Moss Bay Iron & Steel Works of England, visited Washington on a tour of inspection, and after a thorough personal investigation, in which he expended thousands of dollars, was convinced that in the region of King County could be established a great iron and steel plant that for advantages of location could no where else be excelled. The results of his experiments with all the materials close at hand for the manufacture of the best Bessemer steel were a surprise not only to himself, but even to those who supposed they were acquainted with the natural richness of the region.

The field was practically unoccupied. In all of Washington there was but one iron plant established. On the western shore of Puget Sound near Port Townsend there was in successful operation the Irondale works, which had been established in 1882, and which were turning out pig iron manufactured from a refractory ore obtained on Texada Island, charcoal being used in reduction. Washington at that time had just entered on that era of rapid settlement and development which still continues and

has attracted the attention of the country at large. The demand for iron and steel, Mr. Kirk saw, would naturally be very great, and the large saving in freight rates would add profit to what would already be a very profitable enterprise. Besides the demand of Washington would be that of the other Pacific States, to say nothing of the export trade which might be had to the South American and Eastern nations, all of which could be supplied much more cheaply from Puget Sound than from any other point. Mr. Kirk determined to take advantage of the situation, and in 1888, after two years spent in investigation and experiment, formed the Moss Bay Iron & Steel Company of Washington. Still further experiment and the matter of selecting the most advantageous site for the works engaged the attention of the new company for many months. It was at one time proposed to locate near Cle Elum, just east of the Cascades, but the superior advantages of the Snoqualmie district and King County were soon manifest, and a site on Sallal Prairie was selected. This in turn was abandoned for the more advantageous location on the eastern shores of Lake Washington. As the wonderful resources of the region for the manufacture of iron and steel became more fully realized it was determined to swing the enterprise on a more liberal scale than at first contemplated, and with this in view the company was in June of 1890, reorganized as the Great Western Iron & Steel Company, with a capital stock of $1,000,000, paid up, and powers to increase to $5,000,000, as the work progresses, and in that same month work was commenced on the site at Kirkland for an iron and steel plant that for extent and capacity is at present only equaled by the recently consolidated works at Chicago.

The capitalists interested in this gigantic enterprise are men known from the Atlantic to the Pacific, the country over, and the simple fact that they are interested bespeaks speedy completion and energetic operation of the works. Among the shareholders in the corporation are Gen. Russel A. Alger of Michigan, Joshua M. Sears, the Boston millionaire, Senator J. Sloat Fassett of Elmira, N. Y., H. A. Noble of the Baker Barb Wire Works, Edward Blewett of Fremont, Neb., W. A. Underwood of New York, president of the American Water Company, and L. S. J. Hunt, Peter Kirk, A. A. Denny, Jacob Furth and Bailey Gatzert of Seattle, besides other men well known in the financial circles of the country. The affairs of the company are under the direct management of a president and two directors, L. S. J. Hunt being president and Peter Kirk and H. A. Noble managing directors. It is to these gentlemen the writer is indebted for information concerning the steel works. He also visited the works and was shown about by Mr. W. W. Williams, secretary, and Mr. J. G. Kellett, resident engineer, both of whom had been life long employes of the Moss Bay Company of England, before their connection with the Kirkland Works. Prior to the spring of 1890 all the government

land along the east shore of Lake Washington had been taken up, and as has been already stated, much timber had been cut and clearings made for orchards and farms, the land being especially fine for fruit, berries and vegetables. Directly opposite Union bay the small town of Houghton had grown up and three miles to the north was Jaunita, another small town. Between the two, jutting out into the lake, with Pleasant bay on the south and Jaunita bay on the north was a fine level plateau, mostly cleared and set out to orchards. Directly back from this natural town site, about two miles from the lake, was the site selected by Mr. Kirk for the steel works. At the time this was determined on a company of gentlemen purchased considerable of the property between the two bays and the town of Kirkland was there platted. Wharves and warehouses were erected, and such other buildings as were immediately demanded, and five or six miles of street planking was put down. Although the original town-site company has done not a particle of "booming" and indeed did not care to, the place has grown rapidly. The tents and "shacks" first erected for the transaction of business, have given place to substantial brick buildings, and the erection of residences has been so extensive that now the two small places to the north and south are nearly connected and the whole is practically the town of Kirkland. For these building operations, Kirkland has herself produced most of the material; her own saw-mills have furnished most of the timber and her own brick yard the bricks. Between the lake shore and the steel works a large area has been cleared of the timber, and it is an accepted prophecy that in a very short time this space will be thickly built upon.

The site on which is now being built the largest steel plant in the country was in June of 1890 a dense piece of woods, the giant cedars and firs standing so thickly as to almost exclude the daylight. This, however, was not an impediment but a blessing, as vast quantities of timber must be used, and here was the material on the ground. A saw-mill capable of handling the large logs was erected, and the clearers followed the loggers in their work, and were in turn followed by the graders and builders. Up to the 1st of March, 1891, the mill had been constantly busy, and had cut more than 3,000,000 feet of lumber, all of which is being used in construction of the works, and the mill is still but at the commencement of its task.

One hundred acres of ground had been set apart for the works, but this was found to be insufficient, and 20 acres more, to be used as a site for the manufacture of fire bricks, have been added. Most of the fire bricks for the furnices will therefore be manufactured on the ground. Indeed, almost all the material for the erection of the buildings, bunkers, and the vast array of machinery and tools for the plant are to be manufactured on the spot. The works are to be "self-constructive," and it is doubtful if there is another spot on the globe where this undertaking could be ac-

complished so thoroughly, quickly and economically, unless perhaps on Jules Verne's "Mysterious Island," which, however, that ingenius author has never definitely located.

It is no exaggeration to say that the entire works and machinery could be built without going outside of the county for material. To hasten the work of construction, however, a great deal of material and machinery was purchased in Glasgow, Scotland, and the first shipload arrived in Puget Sound March 7, 1891. Two other shiploads were then on the way from Great Britain.

The steel works proper will reduce the fine Snoqualmie ores to Bessemer steel billets and steel rails, but there will be in connection large plate iron works, foundary, blacksmith shops and machine shops, besides hundreds of coke ovens, brick-yards for the manufacture of fire-brick, and the saw-mill already in operation. The number and extent of the buildings required for these vast works can only be realized by a thorough inspection and understanding of the plans for the works, or by a visit to the scene of operation. The works are being built on a "duplicate" plan, that is, from a line through the center, the buildings and plant on each side will be *fac similies*. The plans call for four large blast furnaces and their accessory plant. The furnaces will be 75 feet high with a capacity of 1,500 tons per week each, and so soon as the first two are in operation 3,000 tons of steel rail will be rolled each week. Some idea of the extent of the buildings of the Bessemer works, rolling-mills and finishing departments can be gained from the statement that rails are to be rolled in five-length strips, and as the rolling-mill must be twice this length, with an addition for trimming and working room at each end, it must be at least 320 feet long; then there are the cutting and finishing departments as extensive in proportion, and these, as all other buildings, in duplicate.

The policy in building is to complete one-half of the works as soon as possible, and thus, as the plans are for works in duplicate, they will be ready to run at just half their ultimate capacity while the balance of the buildings and plant are being erected. Although material and machinery are being received from Great Britain, by far the largest part, even for the first half of the works, will be manufactured on the grounds and for this reason, those buildings first needed for this work are being erected and furnished with machinery. Buildings for pattern rooms, blacksmith, foundry and machine shops are now up and being supplied with machinery. A small blast furnace is being erected in the foundry and the shop will be capable of handling 30-ton castings. The foundry is 160x92 feet; the machine shops 90x60; the blacksmith shops 61x40, and the pattern department 90x40.

The large site for the works is almost entirely cleared and the work of grading and laying of the foundations for the large furnaces, engines and boiler rooms, and Bessemer works is almost completed. The engine

houses for the blast furnaces will each be 94x40 and each accommodate two engines of 84 feet, with a piston stroke of 42x60. The 12 boilers to be first put in will be 30 feet in diameter. The cast house will be 160x34 feet. Provision is made for 12 immense stoves for heating air for the blast furnaces, and for numerous large water tanks, to supply the hydraulic machinery in the various departments.

The bunkers for ore and coal are 360 feet long by 42 feet wide and 34 feet in height. Thirty bents, just one-half of the entire structure are already up, and will accommodate about 18,000 tons. The bunkers are on the best possible plan for convenience with two tracks both above and below.

Directly back of the ore bunkers is another trestle work, over ore and coal bins which will have a capacity of about 50,000 tons and which will be used for a reserve stock for any emergency which might arise. Back of this trestle work are being constructed 200 coke ovens, which will turn out enough coke for one of the large blast furnaces. These ovens will be increased to the necessary number by the time the entire works are ready for operation.

The Belt Line Railway runs directly through the works and a network of spurs and trestlework is being constructed to lead to the ore and coal bunkers and coke ovens. Indeed the construction of the steel works is being pushed as rapidly as possible in every direction. The outlay has already been enormous, in the neighborhood of $1,000,000 having thus far been expended by the company.

In conversations with Mr. H. A. Noble and Mr. Peter Kirk, managing directors of the company, those gentlemen said in substance:

"The operation of the Kirkland Steel Works will be of much more importance to the development of this region and the state at large, than is generally realized. They will produce weekly thousands of tons of the finest Bessemer steel by the direct process. The labor this will involve in so many directions—in mining coal and iron, coke manufacturing, building, transportation, and so on—is enormous. If you thoroughly understand the magnitude of the works at Kirkland, you will see that there alone will be employed more than 2,000 workmen. The institution could not possibly be carried on with less than that number. Then there are the smaller concerns that will be attracted by the operation of the steel works—manufactories which will require iron and steel; manufactories that will require large quantities of both timber and metal. As a result of the opening of the works other industries will naturally spring up close by, as for instance the manufacture of fire brick, which the steel works will inaugurate; the manufacture of lime, cement, mineral paint and such products. It will be a good point for tanneries, marble works, flour mills and for smelting works for the reduction of precious metal ores. Already it has been decided by several companies which are now being

organized to locate manufactories on the east shores of Lake Washington. We are not at liberty to give facts and names in connection with these enterprises, as of course, for the present these matters are confidential, but we can state that they will be very extensive, requiring a large amount of capital, and will employ hundreds of men."

In referring editorially to the arrival of the first cargo of material for the Great Western Iron & Steel Works, the Seattle "Post-Intelligencer" of March 8, '91, says:

"It has long been understood that the greatest wealth of Washington lay in its vast deposits of iron ore. Great as is its wealth of forests, vast as are its beds of coal, rich as are its valleys, the wealth of its iron deposits exceeds the wealth of all. Only the systematic development of this great resource has been needed to make Washington take a place among the foremost manufacturing states of the Union: * * * * * The completion of the Great Western Iron & Steel Works will revolutionize industrial conditions in Western Washington. With the various iron-working industries which will follow the operation of these mills and furnaces, iron instead of lumber will become the great product of this region and labor will find a new and remunerative employment."

For wealth of iron, coal and timber, both in quality and quantity, Western Washington stands pre-eminent, and when the comparitively small area as yet under cultivation is considered the Puget Sound region far outstrips, in agricultural productiveness, any other section of the country. These are the fundamental elements necessary for a great manufacturing commonwealth, and when it is added that the climate of the region is that best fitted for continued manual labor—an equitable climate varying in temperature but a trifle the year round; plenty of rainfall, but evenly distributed, and always a dry, warm harvest time—the conditions for material development are perfect. That development has begun and its continuance will be rapid.

IRON ORES.

WASHINGTON'S deposits of iron ores are so extensive as to warrant the statement that they are practically inexhaustible, and their variety and superiority have been proven. According to George A. Bethune, state geologist, great quantities of iron ore have been found in 21 counties of the 33 comprising the state. Among the varieties of iron ores found in large quantities, and which are most adapted for the manufacture of first-class iron, are the hematite (specular or red iron stone, limonite (brown iron stone), magnetite (magnetic ore), and bog ore.

Foremost in the list of these ores, as to quantity, quality and adaptability, are the ores of the Snoqualmie in King county. These ores are of the magnetite and hematite varieties, and are found on the ridges and peaks of the Cascades about 800 to 1,000 feet above the chief water courses at the head waters of the Snoqualmie river. The ores lie in pockets of various sizes, and rest on layers of quartzite and syenite, being overlaid by limestone. These ores are higher in their percentage of metallic iron and lower in phosphorus than any others yet discovered. It will thus appear that they are best adapted to the manufacture of Bessemer steel, and for this purpose they surpass any ores yet discovered, not only in this country but anywhere on the globe. Add to this fact the abundance in close proximity of fluxes and fuels—limestone, coal and timber—and the great value of these iron deposits is at once apparent.

A great deal of development work has been done on two of the mining properties of this section—the Guye mines and the Denny mines—and a large force of men are at present engaged in the last named, getting out ore for the Great Western Steel Works at Kirkland, as it is expected that by fall of 1891, one or more of the large blast furnaces of those works will be ready for operation. These two mines lie about two miles apart, above the middle fork of the Snoqualmie, and are about of the same character. The Denny mine is close to the line of the Seattle, Lake Shore & Eastern railroad which at present is constructed east as far as Salall Prairie, within 20 miles of the mines. President Oakes of the Northern Pacific, of which great railroad system the Lake Shore is now a part, has stated positively that the line will be extended to the mines by the time the steel works are ready for the ore. As before stated the probabilities are that the line will be extended through the Snoqualmie Pass to a junction with the Northern Pacific system east of the Cascades, at that time.

The Denny Mining Company owns about 120 acres, throughout which croppings of magnetic ore are abundant. The ore lies in beds 20 to 30 feet thick and from 70 to 100 feet in extent. Numerous assays of this ore have been made, and a comparison shows that they all are superior to any other iron ores mined in the United States or elsewhere. The following table gives the average of analyses of five or more samples, from reliable authorities:

ANALYSES OF SNOQUALMIE IRON ORES.

Mine.	Variety.	Authority.	Metallic Iron.	Silica.	Sulphur.	Phosphorus.
Denny	Magnetite	C. K. Jenner, from Philadelphia chemist	69.31 1-6	2.47 5-8	0.021 1-3	0.034 1-3
Guye	Magnetite	Dewey and Kirk	69.26 1-5	1.96	0.019	0.032
Average Snoqualmie	Magnetite	George A. Bethune, State Geologist	67.30	5.21	none.	0.04
Average Snoqualmie	Hematite	Peter Kirk	60.90	11.77	0.02	trace.

Comparing these results with averages of analyses of the best steel ores in the United States it is found that the Snoqualmie ores head the list in point of excellence, as the following table will demonstrate. The first is an average of the three averages of magnetite ores given in the preceding table; the second is an average of "the best steel ores of the United States," reported in 1885 by Mr. Phineas Barnes; the third is an average of Lake Superior steel ores, given by W. H. Ruffner, LL. D.; and the fourth is an average of ores from the Iron Mountain, Missouri:

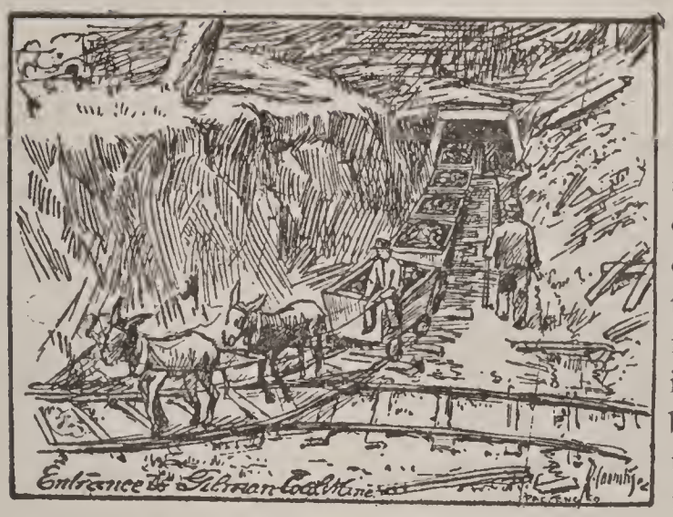
ANALYSES OF STEEL ORES.

Name.	Metallic Iron.	Silica.	Sulphur.	Phosphorus.
Snoqualmie	68.62 4-9	3.215	0.013 4-9	0.035 4-9
Average Ore of United States	59.24 2-3	6.17 2-3	0.20 2-3	0.03 2-3
Lake Superior	68.48	2.07	----------	0.053
Iron Mountain	65.50	5.75	0.016	0.040

The adaptability of the Snoqualmie ores for producing the best Bessemer steel is thus beyond question, but that is not the only advantage for the manufacture of iron and steel which this region possesses. In his report of the iron trade of 1886, Mr. Swank says: "It is also a fact worthy of notice, for which geologists may find a reason, that nowhere in this country are our best steel making ores found in proximity to mineral fuel, either anthracite or bituminous, while in some parts of the Lake Superior region, even timber suitable for the manufacture of charcoal is almost wholly wanting." This statement was made before the value of the Washington iron and coal deposits was realized. It is, perhaps, still true in the main, but the Cascade mineral region is a notable exception. Here are found the best steel ores, both kinds of fuel in limitless quantities, and plenty of the finest limestone for flux, all in close proximity. In other sections ore, fuel and flux travel hundreds of miles to meet each other; here they are found side by side, practically. It is estimated and confidently expected by the Kirkland Steel Works people that this will result in a saving of nearly 30 per cent. in the cost of manufacturing over that of any other mill in the country.

King county is not alone in its wealth of superior steel ores. Along the northern line of the Seattle, Lake Shore & Eastern railroad are being worked numerous mines which promise to yield ore nearly equal to that of the Snoqualmie. The brown hematite of the Hamilton mines in Skagit county are especially fine, and too, the red hematite of Whatcom county. A high grade bog ore is also found in all the counties bordering on Puget Sound. Large deposits of fine ore have also been opened up in Kitsap, Snohomish, Pierce, Thurston and other counties, both east and west of the sound and on both sides of the Cascades. Lake Washington is in the center of this great mineral state and to her shores from the east, west, north and south can most readily be brought together for manufacture and reshipment the ores of the entire region.

EXTENSIVE COAL FIELDS.



UNDERLYING the entire Cascade region of the state of Washington and cropping out at the surface in innumerable localities, are vast beds of coal, varying in thickness of strata from a mere trace to seams eight to sixteen feet in thickness, and differing in quality from low grade brown lignites to fine bituminous coking coals and hard free-burning anthracite. As with iron ores, so with the coal deposits of the state—they are more varied in character and more extensive; more easily mined, and in some respects more valuable, as a whole, than those of any other section of the country. The development of Washington's coal mines has but just begun, in reality, though during the past few years millions of tons have been mined, and already the entire Pacific coast is looking to the Evergreen state for fuel supply. The coal output of the state is increasing very rapidly, the increase in 1890 being nearly one-half of the output of 1889. The figures are: for 1889, 911,527 tons; for 1890, 1,349,773; increase, 438,246. There is no doubt that 1891 will see an even greater percentage of increase, as vast beds in different parts of the state are continually coming to light, and they, with others already located, will be developed, while the opening of new railway lines, many but just completed, and others soon to be, will afford the necessary transportation facilities for this new output. At present the Pacific coast market is supplied with coal from Nanaimo in British Columbia and from Australia, but these coals are being rapidly supplanted by the Washington product, much of which is of superior qualities. Hitherto the mines of Washington have been unable to meet the demand made upon them, and there is not much doubt that it will be some time before they will be able to, as, though their yield is steadily increasing, the increase in demand is even greater.

The coal mines of King county lead those of other sections of the state, both in extent, quality and development, their output for 1890 being greater than those of any other section. The coal fields of the country

lie along the eastern portion, from north to south, in the foothills of the Cascades. They might be divided into three groups—the Snoqualmie, Raging River and Sammamish or Squak; the Cedar River or Coal Creek, and the Green River. Many good properties in these groups have not yet been developed, notably the Raging River mines, which, however, are now being opened up, and a spur from the Northern Pacific main line is being built from Common Point along the Raging River to the mines. The Snoqualmie Coal and Coke Company have also opened a vein and are now developing what has turned out to be a good property, near Snoqualmie, about a mile from the Seattle, Lake Shore & Eastern Railroad, and a spur from that railway will be immediately built to the mine. John Kangley & Co. have just commenced active operations on a mine near the Northern Pacific line, on the western slope of the Cascades, which was first opened in May of 1890. The coal is a black bituminous, firm and free burning, and from tests shows very good coke. The mines of King county now in operation, and constantly increasing their output, are as follows: Newcastle or Coal Creek, east of the southern end of Lake Washington and near the Belt Line Railway, on Cedar River; Cedar Mountain, Black Diamond, Franklin and Fulton, in the Green River district, which extends for 25 miles southeast from the foot of Lake Washington; and the Gilman mines, near the foot of Sammamish Lake, on the line of the Seattle, Lake Shore & Eastern railway. The Green River mines are reached by the Columbia & Puget Sound railway, which connects with the Lake Washington Belt Line at both Renton and Black River Junction.

It will thus be seen that by the Belt Line the eastern shore of Lake Washington is practically made the transportation center of the entire coal region of King county, and by its connection with the main line of the Northern Pacific on the south and with the Lake Shore road on the north, it is also the center of the vast coal fields of the entire state. A glance at any good map of the state will clearly demonstrate this.

Following is a statement of the output of the mines of King county and of those of the entire state, for 1890:

OUTPUT OF COAL FOR 1890.

KING COUNTY MINES.	TONS.	ENTIRE STATE OF WASHINGTON.	TONS.
Newcastle, or Coal Creek	159,524	King County Mines	488,306
Cedar Mountain	21,740	Roslyn, Kittitas County	419,471
Black Diamond	173,024	Pierce County Mines	403,354
Franklin and Fulton	63,779	Bucoda, Thurston County	38,642
Gilman	70,239	Total, 1890	1,349,773
Total, 1890	488,306	Output, 1889	911,527
Output, 1889	391,183	Increase	438,246
Increase	97,123		

East of the Cascades the mines which have been opened up and worked extensively are those at Roslyn, 20 miles from the Summit on the line of

the Northern Pacific. The coal is a black, firm, free-burning bituminous, and is a good coking coal. Good coal beds are now being developed on the upper Yakima and near Ellensburg.

Charles C. Woodhouse, a coal expert of well known standing, divides the coal fields of Western Washington into six groups, as follows: King county, or Green River; Wilkeson, Pierce county; Bucoda, Thurston county; Cowlitz, Lewis county; Skagit River, Skagit county; Bellingham Bay, Whatcom county. Speaking of the King county mines, he says:

"This field is very extensive. The coal ranges in quality from bituminous lignite to heavy bituminous coking coal. It is found in inexhaustible quantities, comes out of the mines in uniform sized pieces for use, is hard and clean, bunks and carries without waste and is an excellent domestic and steam coal. There is very much of this valuable coal land undeveloped."

The Wilkeson district begins near South Prairie on the Northern Pacific railroad, is about five miles wide, east and west, and extends 30 miles south to the Nesqually river in Suckitash valley. Of the coal of this district Mr. Woodhouse says: "The lower measures yield a heavy bituminous coal which makes a strong, compact, sonorous coke, the best, without question that can be produced from any coal in America west of Pennsylvania. The coal from this district, like all of the heavy bituminous coals in the state, has the pleasing advantage of being suitable for all uses, domestic, steam, blacksmithing, coke, etc. It is high in fixed carbon and rich in hydrocarbon gas, is very lasting and evolves great heat."

The Bucoda district extends from Tenino on the Northern Pacific south to the Columbia river, and east and west from the foot of the Cascades to the coast range, embracing a territory about 50 by 60 miles. The outcroppings for the most part show but a fair grade of lignite, though there are many discoveries of good bituminous veins, and prospectors claim locations of good anthracite in the Chehalis valley.

Two very good coal properties are now being worked in the Skagit River district, both near Hamilton, about 30 miles up the river, on the Seattle & Northern, about 12 miles east of Sedro on the Seattle, Lake Shore & Eastern. On the north side of the river are the Skagit Coal Company's mines and on the south side are those of the Cumberland Coal Company. This coal is a strong bituminous, and good coking article. Several prospectors claim they have located anthracite veins in Skagit county, which are as yet remote from transportation facilities. A bed of good bituminous coal, recently discovered, six miles from Stanwood, in Skagit county, is now being opened up.

The Bellingham Bay district alluded to by Mr. Woodhouse, has never produced anything but a fair grade of lignite, and owing to seepage

from the bay, the mines, which were opened up several years ago, have been abandoned. But there have been discovered in Whatcom county, near the southern end of Lake Whatcom, and six miles west of the south fork of the Nooksack river, extensive beds of a heavy bituminous coal, which for general purposes and for coking is equal if not superior to anything yet discovered in the state, or on the Pacific Coast. J. F. Wardner, J. F. McNaught and others have organized a company for the working of this field, now known as the Blue Canyon mines. In January, 1891, a contract was entered into by the company with the Northern Pacific, which provides that that railway shall handle the output of the mines, and construction of a spur from the Lake Shore & Eastern, only four miles distant, was begun, and is now being completed, the Blue Canyon Company agreeing that the output should be 100 tons per day from the start. Work on the mines was also immediately begun, machinery put in, shafts sunk and a great deal of coal gotten out. So soon as the railway is completed a large force of men will be employed. The coal lies in three distinct measures, all of the same character and easily worked. The largest vein shows 16 feet of solid coal between walls. These mines will undoubtedly add very largely to Washington's coal output. Their product will be shipped by water from Anacortes and by rail over the Seattle, Lake Shore & Eastern and the Lake Washington Belt Line. Prospectors who state that they are not yet ready to make their discoveries public, claim to have located anthracite coal veins in the Nooksack country.

The Cowlitz coal fields are on the headwaters of the Cowlitz river, near the pass through the Cascades. The coal is a hard, lustrous, free-burning anthracite. There are exposed twelve veins carrying from two to eighteen feet in width, between sandstone walls. But little development work has been done on them, owing to their distance from transportation facilities.

Anthracite coals of Washington differ from those of Pennsylvania in that they are the outcome of deposits of vegetation of the cretaceous period, much less remote than the carboniferous period, during which the foundations for the coal of Pennsylvania were laid, and so have been subjected to less heat and pressure, and too, are from a different class of vegetation. The Washington coal contains about 6 per cent. less fixed carbon than the Pennsylvania coal, with 1.5 per cent. more gas and 4 per cent. more ash. The difference in value therefore is but a trifle.

Following is a table of assays of the different coals from the more prominent mines and coal fields of the state, made by well-known authorities. They vary as to method of analysis, and as a consequence of that, and because of difference in specimens treated, also vary in result. The showing is a good one, and demonstrates the variety of the coals found in the State:

ANALYSES OF WASHINGTON COALS.

Coal.	Authority.	Volatile.	Sulphur.	Water.	Fixed Carbon	Ash.
Raging River, King Co.	Company's report	34.12	0.33	3.92	60,53	1.10
Green River, King Co	C. C. Woodhouse	20.90	--------	1.40	68.40	9.30
Newcastle, King Co	Geo. A. Bethune	46.70	0.13	2.12	43.90	7.15
Newcastle, King Co	Bailey Willis	44.84	--------	4.16	43.86	7.14
Green River, King Co	Bailey Willis	45.71	--------	2.50	48.37	3.42
Black Diamond, King Co	Geo. A. Bethune	47.19	0.01	3.11	45.11	4.58
Snoqualmie, King Co	Geo. A. Bethune	34.28	0.19	3.90	60.53	1.10
Gilman, King Co	Geo. A. Bethune	47.07	0.88	4.80	37.19	10.06
Wilkeson, Pierce Co	Bailey Willis	25.88	--------	1.33	60.67	12.12
Wilkeson, Pierce Co	Geo. A. Bethune	25.88	trace	1.33	66.75	6.04
Skagit River, Skagit Co	Geo. A. Bethune	18.80	trace	1.19	71.66	8.35
Skagit River, Skagit Co	Prof. Price	19.38	--------	0.47	68.30	11.85
Blue Canyon, Whatcom Co.	S. G. Dewsnap	29.55	--------	--------	65.48	4.97
Cowlitz (Anthracite) Lewis Co	C. C. Woodhouse	7.70	--------	0.70	82.10	9.50
Roslyn, Kittitas Co	Geo. A. Bethune	39.70	trace	3.10	52.65	4 55

But very little coke has yet been manufactured in the state, notwithstanding the abundance of superior coking coals. The reason for this is two-fold. It is but a short time ago that the extent and character of the coal beds were practically unknown, and but recently that railways were built and development begun. The home demand for coke has been small and outside markets unacquainted with its value. All this is now changing, development of the mines is progressing, railways being multiplied, the establishment of manufactories is creating a demand for good coke at home, and already it is being shipped out of the state. Coke ovens have been built by two companies in King county, two in Pierce and one in Skagit, and the Kirkland Steel Works will themselves manufacture the enormous quantity of coke necessary for the running of their four great blast furnaces east of Lake Washington.

The following table gives analyses of different cokes manufactured from Washington coal, and shows how they compare with the best cokes of Pennsylvania and England :

CHEMICAL ANALYSES OF COKES.

Coal Manufactured From	Combustible Carbon.	Ash.	Sulphur.	Phosphorus.	Water.	Volatile Hydrocarbon.
Raging River, King County	97.90	1.76	0.31	0.105	--------	--------
Green River, King County	97.93	1.81	0.26	trace	--------	--------
Wilkeson, Pierce County	98.63	1.23	0.13	0.01	--------	--------
Skagit River, Skagit County	88.21	11.23	0.56	--------	--------	--------
Alleghany, Blair County, Pa	87.58	11.36	1.06	--------	--------	--------
Connelsville, Pa	89.576	9.113	0.821	0.100	0.030	0.460
Durham, England	93.41	5.30	0.91	--------	0.38	--------

A test of Blue Canyon coal gave 61.17 per cent. of coke, which is 1 per cent. higher than obtained from the famous Connelsville, Pa., coal.

It will be admitted that the coals of Washington will play a powerful part in the development of the new state, and their proximity to the iron ores renders both doubly valuable.

LIMESTONE, MARBLE AND GRANITE.

Deposits of limestone of superior quality, throughout the state of Washington, are phenomenal in their extent. As before stated, this wealth of limestone is the third great factor which will make of Washington a great iron and steel producing state, lying as it does so close to the extensive ore beds and coal fields, convenient to be manufactured into lime for use as a flux in smelting. Prominent among the counties west of the Cascades in which limestone deposits are very extensive are King, Pierce, Skagit, Whatcom, San Juan and Island counties. Of the quality of the limestone of the state, Geo. A. Bethune, state geologist, says: "I have demonstrated beyond a doubt to myself that nearly every known limestone deposit thus far discovered will make a quality of lime unexcelled." Among several analyses of limestone given by Mr. Bethune, that of the Snoqualmie valley, King county, stands at the head in percentage of carbonate of lime, as follows: Snoqualmie stone, 98.34 per cent.; Roche Harbor, 98.21; Okanogan, 97.13; Skagit county, 96.50; Stevens county, 98.

Throughout the Snoqualmie valley and at the headwaters in the Cascades are extensive ledges of every variety of limestone. In color the stone ranges from almost white to dark blue, and in texture is sometimes very fine grained, and in some ledges is crystalized into a beautiful marble. Mt. Logan, above the Guye iron mines, is one vast rock of limestone, and above the iron ore deposits of the Denny mines are great ledges of limestone.

It is only during the past five years that the manufacture of lime in the state of Washington has been carried on extensively, and now the largest output is from the kilns of the islands of San Juan county, one company at Roche harbor turning out 1,000 barrels per day the year round. Various companies have recently been formed in different parts of the state, to develop quarries, and now that railroad facilities are increased and still increasing different properties, notably those of the Snoqualmie valley, will be worked. During 1890 there was manufactured in the state 925,750 barrels of lime, worth $1,157,186. A great deal of this was shipped to British Columbia, Oregon and California, and the demand is increasing more rapidly than the supply.

These limestones of the Snoqualmie valley will not only come into use for iron manufacture and for lime to be used as a building material, but the field is too valuable to long remain untaken by manufactories of various valuable chemicals, such as caustic soda, calcium, etc. The materials for the manufacture of Portland cement are also abundant and of the best. State Geologist Bethune gives the following analyses of a very superior quality of Portland cement manufactured from Washington limestone and clay :

ANALYSES OF WASHINGTON PORTLAND CEMENT.

	Silica and Clay.	Alumina Oxide.	Ferric Oxide.	Lime.	Magnesia	Potash.	Soda.
No. 1.	27.16	9.30	2.20	52.30	5.67	0.97	2.40
No. 2.	25.19	11.40	3.02	53.78	4.28	0.43	1.90

The marbles of Snoqualmie valley and of the Skagit valley are remarkably fine, of close texture, of many different colors from a fine white to grey, and black and white mottled, and compare very favorably with Italian and Vermont marbles. Many varieties are very beautiful, are of fine grain and great strength and admit of a high polish. Their value for architecture and sculpture has already been demonstrated, and the time can not be far in the future when the stone will be extensively quarried and large marble works established in the vicinity of Lake Washington and the Belt Line railway.

Close grained granites, free from sand streaks, of many varieties, and capable of a high polish, are found, not only in the territory immediately on the lines of the Northern Pacific, Lake Shore & Eastern and close to Lake Washington and the Belt Line, but in almost every section of the state, and many quarries have recently been opened.

Sturdy sandstones of many different colors from a rich buff or bluish grey to olive green are abundant, and have been used during the past few years for building business blocks in the various cities of the state.

While speaking of stone and building material, it may not be out of order to refer to the many varieties of manufacturing clays found in the state, and especially in King county and the region directly east and south of Lake Washington. Reference has already been made to the value of these clays for the manufacture of cement and for the making of fire brick, for which latter purpose they will be used at the works of the Great Western Iron and Steel Company, on the eastern shores of Lake Washington. Extensive beds of a superior quality of clay for the manufacture of fire brick are found throughout the coal fields of King county. An analysis, made by George A. Bethune, of clay from the Black Diamond beds stood 2,760 F. before fusing, and another from the Green River beds stood 2,831 F. They were as follows :

ANALYSIS OF FIRE CLAYS.

	Silica	Alumina	Iron Oxide.	Lime	Magnesia	Alkalies	Water	Potash	Soda	Lost by Ignition
Black Diamond	57.50	34.37	1.24	0.50	1.00	0.68	4.71	----	----	----
Green River	69.71	18.39	1.44	0.35	0.15	----	----	0.19	0.83	8.94

Speaking of the abundance and variety of clays found in this region Mr. Bethune says in his last report : "Among the most important I may mention clay for brick, both pressed and rough ; clay eminently suited for the making of fire brick ; clay suitable to undergo the treatment of the potter ; clay demonstrated to be the very best for moulding into building ornamention ; clay that may be transformed into porcelain and such ware, which I know from personal investigation will equal the famed wares of the Japanese and English in quality ; clays for stone ware are as good, and from what I have read, far more plentiful than any deposit elsewhere on this continent or in Europe."

During 1890 there was manufactured in King county brick, tile and pipe to the value of about $700,000. The manufacture of clays into merchantable articles of every variety, will undoubtedly grow to large proportions during the next few years, and it is fair to suppose that most of this manufacturing will be done close to the source of supply of material and fuel, and where transportation facilities are most advantageous—along the eastern shores of Lake Washington.

It may not be out of place to refer here to other valuable mineral deposits of the region, extended mention of which cannot be made, but which will figure largely in the manufacturing interests of the immediate

future, offering as they do cheap raw material for the manufacture of a variety of articles of commerce. Of the precious metals, silver and gold, particular mention will be made. Lead is abundant in the Snoqualmie country and all through the Cascade range, being found mostly in veins that carry a percentage of gold or silver or both. Copper veins have been located at many different points, but little development work has yet been done. In January, 1891, several locations on valuable copper deposits were made in the Cle-Elum district, near the line of the Northern Pacific, just east of the mountains. These mines will be developed immediately.

Asbestos has been recently discovered in several localities, and from deposits near Hamilton on the south side of the Skagit, a large quantity of this fire proof substance has been taken and shipped for use in the manufacture of fire proof paint. It is of superior quality, the fibres as firm as flax and easily separated. Deposits in other localities promise to be equally good.

Graphite of a good quality has been discovered in different localities. Nickel ores have been located in King, Snohomish, Skagit and Clallam counties. Mica, molybdenite, chrome iron and yellow ochre have all been discovered in the Cascade range, and evidences of tin and zinc. In juxtaposition with other minerals and natural substances are found bismuth, manganese, magnesia, sulphur, aluminum, arsenic and mercury.

With all this mineral wealth within easy reach of the eastern shores of Lake Washington, and with such a wide territory the resources of which will naturally gravitate to that point for manufacture, it has come to be a generally accepted fact that as development progresses large and small manufactories of every description will follow the example of the Great Western Iron and Steel Company, and locate in the neighborhood of the lake on the line of the Lake Washington railway.

THE PRECIOUS METALS.

In discussing the "mineral wealth" of any particular country or region, one is prone to think first of, and dwell most, upon the deposits of gold and silver found within its borders. The order has been here reversed, and purposely. Mining for gold has been carried on in Washington for the past quarter of a century, and for the past few years much attention has been given to rich silver mines, and three large smelters and many "stamp mills" are now in operation throughout the state. New locations are constantly being made on gold and silver bearing leads, and mining for the precious metals bids fair to assume within the next few years, phenomenal proportions, and place Washington in the front rank of those states in the Union which produce large outputs of the precious metals. Yet, notwithstanding all this, Washington's wealth of gold and silver is not and will not be the greatest factor in her up-building. She is pre-eminently a manufacturing and commercial state, and as such will soon outstrip many others and equal any of her older sisters in the East. Her supremacy on the Pacific Coast is already assured.

The first discovery of gold north of California was made in Washington in the year 1859 by members of the international boundary commission, on the Similkameen river in what is now known as Okanogan

county. Thousands of miners soon flocked to these rich placer diggings and then deserted them for the fresh excitement of the Frazier. The first placer discovery west of the Cascades was made in 1878, on Ruby creek at the headwaters of the Skagit. In 1874 the rich Squak placers in Kittitas county were discovered and three years later the Peschastin placers in the same district. In 1881 the Cle-Elum diggings were discovered and in 1885 George Runnels located many new and rich placers in the Okanogan country. New placer deposits are constantly being discovered, and the old seem to be renewed by the winter freshets every year, for all those mentioned are still yielding large returns to the miners.

It was in July of 1871 that the first discovery of quartz, bearing precious metals, was made by H. F. Smith and party in the "Moses Reservation," now Okanogan county. All miners, however, were driven out of the reservation and not allowed to enter again until it was restored to the public domain May 5, 1886. In 1873 gold and silver bearing quartz was discovered in Snohomish county, in what is now the famous Silver Creek mining district. In 1878 C. P. Culver discovered gold quartz in the Peschastin district, and the first stamp mill in the state was put in at those mines. In 1881 ore was discovered in the Cle-Elum district and in 1883 the first locations were made in the now famous Colville district. In 1887 occurred the great rush to the "Okanogan Country" and to-day many rich mines are being worked on the "Moses Reservation," and there have been more than 2,500 mineral claims filed, and eight different mining districts are already organized. In Stevens county there are three mineral districts, the Colville, Chewalah and Metaline. The Cle-Elum and Peschastin districts are both in Kittitas county. In Western Washington, along the Cascade mountains is a vast deposit of gold and silver ores extending from the Snoqualmie valley to Mt. Baker, a distance of over one hundred miles. Up to 1890 very few discoveries had been made along this line, but in the summer and fall of that year hundreds of prospectors were in the field and the extent and richness of their discoveries came as a surprise to the public generally. This extensive mineral belt is divided into districts as follows: Snoqualmie, King county; Silver Creek, Monte Christo and Sultan River, Snohomish county, and the Cascade district in Skagit county. It was in the last named district that the Boston mine was located and in the summer of 1890, sold by J. F. Wardner, the well known Couer d'Alene miner, to Butte captalists for $150,000. The ores of all these districts are of much the same formation, being a galena carrying silver and gold mixed with iron or copper pyrites. Assays made, run all the way from 47 ounces silver and 58 per cent. lead to 150 ounces silver and 60 per cent. lead. Ore from one of the claims in the Snoqualmie assays as high as $150 in gold. Several prospects show from $15 to $24 in gold. On some of these new and promising mines but little development work has been done, but upon others good progress has been made and thousands of dollars worth of

ore lies upon the dumps with many thousands more in sight. The ore from the mines in Eastern Washington has heretofore been shipped to smelters at Spokane, Denver or Butte. But this cannot be done with ores from Western Washington. It will have to be reduced nearer home. The summer of 1891 will see the beginning of the systematic working of these mines, which for years to come must employ thousands of men. The reducing of the ores will employ as many more. The eastern branch of the Lake Shore & Eastern Railway taps the Snoqualmie district, a railway is already surveyed by the Northern Pacific which will reach from the Lake Shore road into the Silver Creek, Monte Christo and Sultan River districts, the Seattle & Northern which drains the Skagit valley to the Lake Shore road is now being completed and will naturally afford transportation for the ores of the Cascade district. The entire mineral district of Western Washington will be thus easily tributary to the Belt Line, and ores from the different districts can be brought to smelters located along the eastern shores of Lake Washington. Projects to build smelters in that neighborhood are now on foot, and their building cannot be delayed for long. In conjunction with the establishment and working of smelters, works for the manufacture of white lead, lead pipe, etc., will of course be erected, to utilize the lead product of the silver ores, and these manufacturies will supply employment for many workmen.

TIMBER OF THE SNOQUALMIE.

THE statement has been made that there is more standing timber on the western slopes of the Cascades in the Puget Sound country than would be necessary to supply the demand of the whole world for lumber during the next 100 years. Preposterous as this statement may seem, it is not looked upon as an exaggeration by those acquainted with the wonderful growth and vast extent of the forests of Western Washington.

The lumber industry has been the chief support of commerce and trade of the infant state of Washington, and although millions of feet of timber has been cut, as yet her forests have, comparatively speaking, scarcely been disturbed, excepting along the shores of the sound and along the chief waterways, and in some sections along the railway lines. According to carefully compiled statistics by the Seattle "Post-Intelligencer" the total output of all mills in the state for 1890 was 1,222,830,042 feet, of which 779, 330,042 feet was the output of Puget Sound mills. The value of this output, including spars, piles, shingles, laths, pickets, etc., was about $15,000,000. Of this, $1,324,600 worth was exported to foreign countries, and yet the supply was not equal to the demand, which is increasing rapidly from year to year. This foreign shipment is made to countries in every section of the globe, though Australia takes the largest share. Wherever it goes the demand immediately increases there. A great deal of it has been shipped to eastern states, competing with the home product of those states. The larger portion, however, has been used at home, in building the rapidly growing cities and railroads of the state.

For a combination of extent in area, largeness and number of trees and diversity of growth, the forests of Western Washington are not equaled

anywhere else on the globe, and at the head of them all are the forests of the Snoqualmie valley in King county, really tributary to Lake Washington, and those of the Skagit valley in Skagit county.

King county has an area of about 1,082,000 acres and it is estimated that fully one-half of this is covered with forests of heavy timber yet untouched. A single tree of Douglas fir from this section has been known to yield 20,000 feet of lumber. That of course is an exception, but it is not uncommon for a single acre to yield 90,000 feet. Placing the average per acre at 35,000 feet, it will be seen that there is standing in King county at least 18,935,000,000 feet of timber. This is, however, far below the actual. The first saw mill in King county was built in 1852 and since that time the growth of the lumber industry has been steady till in 1890 more than 250,000,000 feet of lumber was cut by the scores of mills in the county, giving employment to thousands of men and paying for labor in the neighborhood of $3,000,000. This lumber industry is carried on steadily the year round.

More than one-third of the trees in the forests of the Snoqualmie, as indeed all through Western Washington, are the great Douglas firs, or "Oregon Pine," as they are best known. Red and yellow cedar, hemlock, cottonwood, oak, ash, maple and alder are abundant, and some of the cedars rival in size the largest of the giant Douglas firs. Indeed, all vegetation in these forests attains phenomenal size. Mosses of every variety form heavy carpets on the ground and hang from the trees in great bunches yards in length; the ferns grow to great bushes seven and eight feet high, and the alder which, in the Alleghanies is little more than a shrub, is here a good sized tree over thirty feet in height. The ground when cleared yields with the same generosity, and crops from orchards and farms are enormous.

The timber from these forests of fir and cedar is now acknowledged to be better adapted for heavy construction work than any other in the country, and for ornamental work and fine finishing, the cedar, maple, oak and ash cannot be surpassed. The quantity and quality of material for all sorts of wood work manufacturing and for the making of all implements and articles, either useful or ornamental or both, requiring both wood and metal for their manufacture, is so great and good in the region close to Lake Washington and along the lines of railway converging toward the eastern shores of the lake, that the field for manufacturing is already being occupied, and as previously stated, capital has been appropriated for various enterprises which will be set in motion so soon as the Great Western Iron and Steel Works are in operation, some of them even before that time. There is, in fact, no question but that the next few years will see many large manufactories established, one after another in rapid succession, both at Kirkland and other points along the line of the Lake Washington Belt Line Railway.

AGRICULTURAL PRODUCTS.

In considering the advantages of a location for large manufacturing operations one of the chief points taken into account is the ability of the region or tributary region, to supply ample sustenance for a large population, and to do it cheaply. As in all other lines the agricultural development of Western Washington has really but just begun. There are many fertile valleys that have for years been tilled, yielding large crops, and are as fertile now as when first cultivated. The survey of lands and the opening of new railway lines are fast increasing the area of cultivated lands of this character, and the clearing of the forests from the up lands in many sections is also adding many fine farms and orchards to the older ones of the state, but still the yearly agricultural production is small compared to what it promises to become.

There are few products of a temperate climate that cannot be grown in the Puget Sound country to yield big crops. Owing to the cool nights and absence of very warm weather corn will not mature, but that is the only product of importance that does not grow well west of the Cascades. To those who have not seen the crops growing and witnessed the harvest the relation of facts in regard to the yield of the majority of lands in Western Washington, seems the wildest exaggeration, or at best, merely statements of rare and exceptional cases. The crops of Western Washington *are* marvelous. Oats yield from 75 to 140 bushels per acre;

potatoes from 300 to 400 bushels per acre; hay from 3 to 5 tons per acre; carrots, turnips, onions, and in fact roots and vegetables of all descriptions yield exceptionally large crops. Fruits grown on the up lands are very prolific, and all varieties known to a temperate climate can be produced —apples, pears, plums, prunes and berries of all kinds. Orchards pay the farmer from $200 to $300 per acre. Nowhere is there a region that offers, as does Western Washington, both the facilities for a great manufacturing commonwealth, and for an abundant and cheap food supply for its population. Western Washington is known the world over as the finest hop growing section of the globe, the product being superior and the yield larger than elsewhere. The largest hop ranch in the world is in Snoqualmie Valley, which is one of the most fertile in the state. From east of the mountains; from the great Columbia plain—the wheat supply is already far beyond the needs of a great state. It is the most prolific wheat producing region in the Union, and the area of its cultivated fields and its output of grain is being rapidly increased. So great was the yield for 1890 that millions of bushels were tied up, for lack of adequate transportation facilities, and the end of June, 1891, will scarcely see it disposed of. Conservative estimates place the surplus for export at not less than 13,000,000 bushels. The surplus wheat of Washington has been exported mostly by way of the Columbia river and Portland, but with the opening of the railways throughout the state, and the rapid increase in yield, is coming a change, and now large shipments are made by the way of Puget Sound. With the opening of the ship canal to Lake Washington, the bulk of wheat shipments will necessarily be made from the eastern shores of that body of water, and large flour mills and grain elevators will be added to the manufactories at that point, for the same reasons that make it the most advantageous point to which and from which can be shipped the coal, iron, timber and other products and manufactures of the state. In this connection, the Seattle Chamber of Commerce, through a committee, have made an important and concise statement of facts, as what follows will show.

COMMERCIAL KEY OF THE STATE.

THE board of army engineers appointed by Congress to make the survey for the canal from the sound to Lake Washington, applied to the Chamber of Commerce of Seattle for a statement of the benefits to be derived from the canal. A committee of the chamber, consisting of Judge Thomas Burke, Jacob Furth and Colonel C. M. Sheafe, filed with the board a preliminary statement to be followed by a more voluminous and detailed report. After giving reasons why a fine fresh water harbor would greatly benefit the commerce of the state, as outlined in a previous chapter of this work, the committee continues :

"If a canal were constructed in Lake Washington, it is pretty safe to say that nearly all of the wheat and coal shipments of the state would be from the lake. This would be so from the very small cost of handling such products for the reasons above stated, and because it is easier for all of the railroads to reach the waters of the lake than it is to reach the waters of the sound. As a matter of fact, all the existing railroads in the state have either by themselves or by rail connections direct contact with the shores of the lake. The amount of coal shipped now from the sound, mainly from King and Pierce counties, is in the neighborhood of 2,000,000 tons per annum. These shipments in the near future are not unlikely to be more than doubled. The wheat product of the state for the year 1890 was nearly 30,000,000 bushels, and it is safe to say that within ten years the wheat product will be nearly 100,000,000 bushels. The eastern portion of the state, when all the wheat lands are cultivated, is capable of producing about 120,000,000 bushels per annum, or say one-fourth of the present entire wheat product of the United States. The saving in cost to the farmer and the merchants in the shipment of this product by the lake instead of by salt water would amount to an enormous sum.

"In addition to the coal and wheat products, the amount of lumber to be shipped from the lake would be very large.

"There are also within fifty miles of the lake some of the best Bessemer iron deposits in the world. Already transportation has been nearly provided between the lakes and these deposits, and extensive works for the reduction of these ores are now being built upon the shores of the lake, and it is expected that these works and the mines will be in operation within one year from this time.

"Summing up, it may be said that there is not a coal mine of any consequence in the State of Washington that cannot more readily ship its products to Lake Washington than to the Sound. Neither is there an iron ore deposit whose product could not be more readily shipped from the lake. As a site for the establishment of the very extensive manufactures that will be required on the Pacific Coast, there is no point that begins to possess the advantages of Lake Washington. This is so not only by superior natural location, but because of the inexhaustible supply of fresh water. If the construction of a canal was begun at once it could not be completed before the developments in iron mining and manufacturing, and in coal mining and the wheat product would more than justify the small expenditure required."

The construction of the canal does not lie entirely with Congress, as there are now eastern capitalists ready to undertake the task if right of way and a small subsidy in land be granted. The practicability and advantages of the canal are conceded ; a few years will see it in operation.

But it must not be supposed that the superior advantages of the eastern shores of Lake Washington for manufacturing depend upon the construction of the canal. Far from it. That will be but an added advantage. There is no other location that is so near the center of the Puget Sound country, close to all its resources ; so admirably situated near to plenty of water, so advantageous in general lay of the land, or above all, connected so well by railway lines reaching out in all directions. Nowhere in the state do so many rich valleys converge as toward this point —the Snoqualmie, the Cedar river, the Green river, the Puyallup, the White river valleys and their tributaries are all immediately contiguous to the shores of Lake Washington, while the Snohomish, Skagit and Nooksack countries to the north and the Nesqually, Cowlitz and Chehalis to the south and west are all connected by a great system of railways, all meeting or connecting for transportation to King county and the shores of Lake Washington. Directly east are the most feasible passes through the Cascades, through which come the products of Eastern Washington and through which comes the ever increasing transcontinental trade, bound through Puget Sound to the Orient.

Lake Washington is most certainly, as stated, the commercial key of the State of Washington.

INDICATIONS OF A BRIGHT FUTURE.

"COMING events cast their shadows before," but the shadows sometimes take such grotesque forms that the wisest men mistake their meaning. Evidences of future growth of a state, locality or city are never lacking before that development assumes large proportions and stability, but the men who interpret the signs aright and with sufficient confidence to be eventually benefitted are comparatively few. The shadows of events to come at Kirkland and all along the east of Lake Washington, however, are too distinct to admit of mistake as to their meaning. The investment of millions of capital in the great iron and steel works, the building of the Belt Line Railway as the direct route of the Northern Pacific; the interest taken in the situation by the Great Northern and other transcontinental roads, who all admit that they must have frontage on the lake as well as the sound; the preliminary steps taken for the ship canal, and the investment of over $3,000,000 by such men as John Rockefeller, Colgate Hoyt, W. H. Demorest, James McNaught, J. F. McNaught, L. S. J. Hunt and other widely known capitalists, in real estate along the eastern shores of the lake; all points to the fact that the location for manufactories is not only admitted to be the most advantageous, but that it is being taken advantage of and that great industries will be established as fast as it is possible to do so. The natural consequence will be a large population. The steel works alone will, as soon as in full operation, support a population of 20,000 people. It is not at all unnatural to suppose, indeed it is almost a certainty, that within a decade there will grow up about the steel works now being built, a manufacturing city that will rival in point of population and commercial wealth any of the large manufacturing cities of the East—a city that will stretch for miles along the eastern shores of Lake Washington.

IN AND ABOUT KIRKLAND.

By reference to the accompanying map, it will be seen that the Lake Washington Belt Line railroad passes through the most valuable property east of the lake, independent of the fact that the railroad itself enhances the value of the property many hundred times. From a point just above Houghton, it curves to the east from the lake shore for two miles and continues north to the neck of water at the head of the lake. It is at the curve that the Great Western Iron and Steel Works' extensive plant is being built, and close by is the site of the Kirkland Nail Works' plant. It is at this point that the greatest immediate growth in business and population will naturally take place. Here the thousands of workmen employed in the mills and factories must find homes for themselves and families and the necessary commercial business for them be done. It is about this point from the lake shore east that Kirkland is now rapidly assuming the proportions of a city.

The ground lies high and slopes sufficiently for a good system of drainage, while the views in all directions are magnificent, the waters of the lake to the west, with the Olympic mountains in the distance, and the upland and Cascades to the east, with a view of Rainier in the south and Mt. Baker in the north. The water works that will be put in to supply

the large amount of water necessary for the running of the iron and steel works will also supply other manufactories and the residences of Kirkland. From the start the water works will be required to supply as much water as many systems in cities of 30,000 inhabitants. But for that matter, it is not at all improbable that within a year from the opening of the steel works, the population in their immediate vicinity will number 30,000 people, and it is beyond question that within a comparatively short time thereafter, the city on the eastern shores of Lake Washington will have assumed the proportion of a great manufacturing place.

Sites for homes in Kirkland are, for the most part, being disposed of at a nominal price for the reason that the gentlemen interested in the city are also interested to the extent of several millions in different manufacturing companies formed for the purpose of utilizing the resources of the country tributary to this point. The vast works for the manufacture of steel, steel rails, plate iron, nails, etc., are but the percursors of many other enterprises for which these gentlemen have already planned.

The growth in population at and near to Kirkland since the commencement of construction on the steel works has been large, but not abnormal, as until the manufactories are in operation the demand for labor is not of course to be compared to what it will become. During the past year numbers of brick business buildings, hundreds of residences, and churches and schools have been built, miles of street planked, the number of stores increased, and the population added to by four or five hundred per cent. The Baptist University of the Northwest has been located here, has over one hundred and thirty acres of land, and will immediately put up buildings worth $40,000, to be added to as occasion demands.

To the thoughtful man, who realizes that Washington is a new state in a most advantageous geographical position for foreign trade, with incalculable wealth in her mountains and valleys; who has watched the rapid growth and development of the past five years; who realizes the effect of the railway building just completed, being now done and planned for the future; who has studied the map with reference to those roads and the different regions of the state to locate the natural commercial center of this new country, and the point where manufacturing of all kinds can most advantageously be carried on; to that man it will not be a surprise that the shrewdest capitalists and manufacturers of the country; men who have amassed large fortunes by their business ability, have asserted, and backed their assertions by the investment of millions of money, that the great manufacturing city of the State of Washington, is already started to grow on the eastern shores of Lake Washington.

FOR FURTHER INFORMATION REGARDING KIRKLAND PROPERTY

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